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PATENT SPECIFICATION

Application Date: June 17, 1938. No. 18003/38.

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Specification Accepted: Dec. 20, 1939.



PROVISIONAL SPECIFICATION

No. 18003 A.D. 1938.

Improvements relating to Plug and Socket Connectors

I, JOHN BRISTOW TUCKER, of Kings Road, Corner of Redfern Road, Tyseley, Birmingham, 11, a British subject, do hereby declare the nature of this invention to be as follows:—

The present invention has relation to plug and socket connectors of the type wherein two current carrying pins and an earthing pin on the one part are adapted to be engaged with the corresponding sockets on the other part. The dimensions and setting of the pins and sockets of such connectors have varied according to the amperage to be carried, and means have been proposed whereby one socketed base could alternatively accommodate two plugs having differing pins, as for instance plugs adapted to carry five or fifteen amps.

The present invention has for its object to provide such a base and accordingly there is provided a base which is characterised by one isolated socket and two pairs of associated sockets, the isolated socket being of a two dimensional or variable expansive character so that some part or the whole of its inner contact surface superficially engages either of two selected plug pins, the remaining two pins of any given plug being selectively accommodated in either socket of each pair as may be found desirable.

In a convenient embodiment of the present invention the isolated socket in the base is adapted to accommodate the earthing pin. This isolated socket may comprise two or more spring jaws which are so mounted that the earthing pin is effectively accommodated and clinched irrespective as to whether it is designed for five or fifteen amperage service. The remaining sockets are arranged in pairs, that is to say, each pair may comprise a small socket and a larger socket, each pair

of sockets being connected as for instance at their lower parts by a plate or connector associated with a terminal. Separate apertures may be provided in the cover plate of the base wherein the sockets are accommodated and the holes in the cover plate associated with the pairs of sockets may unite with one another. In such an arrangement it will be readily understood that a given socket may alternatively accommodate two plugs, as for instance for a five amp plug the earthing pin is clinched by the elastic earthing socket and the current carrying pins may engage the inner or smaller sockets whereas when a fifteen amp. plug is substituted the same earthing socket accommodates the earthing pin and the larger or outer sockets accommodate the larger current carrying pins.

Instead of the earthing socket being of an elastic nature it may be of a two-dimensional character, the upper part being of a greater dimension than the lower part so that the larger pin fits the upper part and forces the lower part open, whereas the smaller pin merely fits the lower part.

In the foregoing the isolated socket has been described as the socket suitable for the earthing pin. The isolated socket may however be suitable for accommodating a current carrying pin, in which case two pairs of closely associated sockets accommodate in one instance the earthing pin and in another instance the current carrying pin, the particular socket engaged being of course determined by the dimension of the plug pin.

Dated this 15th day of June, 1938.

LEWIS W. GOOLD & CO.,
Chartered Patent Agents,
5, Corporation Street, Birmingham, 2,
Agents for Applicant.

PROVISIONAL SPECIFICATION

No. 21192 A.D. 1938.

Improvements relating to Plug and Socket Connectors

I, JOHN BRISTOW TUCKER, of Kings Road, Corner of Redfern Road, Tyseley, Birmingham, 11, a British subject, do hereby declare the nature of this invention to be as follows:—

The present invention has relation to plug and socket connectors of the type wherein either of two sets of current carrying pins and an earthing pin on the one part are adapted to be engaged alternatively with the corresponding sockets on the other part. The dimensions and setting of the pins and sockets of such connectors have varied according to the amperage to be carried, and means have been proposed whereby one socketed base could alternatively accommodate two plugs having differing pins, as for instance plugs adapted to carry 5 or 15 amps.

A deficiency arose however in such connectors owing to the fact that when a 5 amp plug was used with a 15 amp socket it was possible to fuse the flex without fusing the 15 amp fuse associated with the main circuit, with consequent danger of fire. To overcome this difficulty 5 amp plugs have had fuses installed therein. The difficulty however still existed in that standard 5 amp unfused plugs sold for use with 5 amp sockets could be applied to the new selectively adapted socket with the danger of fusing aforesaid and the present invention has for its object to overcome this deficiency. Accordingly there is provided a plug and socket connector incorporating a base which is characterised by an earthing socket contact and two pairs of associated socket contacts, one or more of the socket contact or plug receiving apertures adapted to receive the plug pins of lesser amperage being characterised by a certain reduction in that it or they will refuse one or more of the standard pins for the said lower amperage, but will receive a plug at least one of the pins of which is correspondingly reduced, this said plug however being capable of engagement with the standard lower amperage sockets. In this specification the use of the word "standard" implies that the article concerned is made to British standard specification.

In a convenient embodiment of the present invention there is provided a base incorporating an earthing socket and two pairs of complementary live sockets. One pair of live sockets is adapted to accommodate the pins of a 5 amp plug and the

other pair of sockets is adapted to accommodate the pins of a 15 amp plug. The earthing socket is common to both, the arrangement being such that a 5 amp plug can be inserted with its earthing pin in the earthing socket and its plug pins in the 5 amp sockets, or alternatively a 15 amp plug may have its earthing pin introduced into the earthing socket with its larger plug pins introduced into the 15 amp sockets. Advantageously the earthing socket is of a flexible or two dimensional character adapted to effectively receive the earthing pin of either plug, it being appreciated that the earthing pin of a 5 amp plug differs slightly in transverse dimension from an earthing pin of a 15 amp plug. To facilitate wiring and installation one 5 amp socket is connected to its neighbour a 15 amp socket, duplex sockets being provided for this purpose of differing dimensions each pair being associated with a terminal.

With such an arrangement it will be appreciated that a 5 amp plug or a 15 amp plug can be used as may be desired. It is undesirable however to utilise a 5 amp plug without a fuse on a 15 amp socket, and the present invention is characterised in that means are provided whereby the ordinary standard 5 amp plug shall not be used with the present mechanism. Accordingly one of the plug pins either the earthing pin, or one of the live pins of a 5 amp plug is provided with a flat face constituting a reduction in the dimension of the pin and the insulating cover for the base is so directed that one of its apertures associated with the 5 amp sockets presents a flat face which while permitting of the insertion of a 5 amp plug with the flat face will refuse an ordinary standard 5 amp plug with round pins.

It is to be appreciated that the manufacturer constructing his special plug with the flat face will ensure that these plugs incorporate 5 amp fuses, and it is further to be appreciated that such specially constructed plugs with flat faces and fuses are suitable for use in standard 5 amp sockets seeing that one of the pins has merely been reduced along its face. Again the ordinary unmodified 5 amp plug with round pins with or without a fuse cannot be accommodated in the present device.

Although flat faces have been referred to upon the pin and socket aperture of the 5 amp plug, it will be appreciated

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that any form of reduction of the pin and its corresponding aperture in the base cover or socket itself will suffice, the desideratum being that although this
 5 plug pin will enter its particular socket, the said socket will refuse an ordinary, completely circular plug pin, the

adapted plug pin being however capable of entering a standard socket.

Dated this 15th day of July, 1938.

LEWIS W. GOOLD & CO.,

Chartered Patent Agents,

5, Corporation Street, Birmingham, 2,
 Agents for Applicant.

COMPLETE SPECIFICATION

Improvements relating to Plug and Socket Connectors

10 I, JOHN BRISTOW TUCKER, of Kings Road, Corner of Redfern Road, Tyseley, Birmingham, 11, a British subject, do hereby declare the nature of this invention and in what manner the same is to
 15 be performed, to be particularly described and ascertained in and by the following statement:—

The present invention has relation to plug and socket connectors of the type
 20 wherein two current carrying pins and an earthing pin on the one part are adapted to be engaged with the corresponding sockets on the other part. The dimensions and setting of the pins and
 25 sockets of such connectors have varied according to the amperage to be carried, and means have been proposed whereby one socketed base could alternatively
 30 accommodate two plugs having differing pins, as for instance plugs adapted to carry five or fifteen amps.

The present invention has for its object to provide such a base and accordingly there is provided a base which is
 35 characterised by one isolated socket and at least two pairs of associated but not merging sockets, the isolated socket being of a two dimensional or variable expansive character so that some part or
 40 the whole of its inner contact surface superficially engages either or any of two or more selected plug pins of differing amperage rating, the remaining two pins
 45 of any given plug being selectively accommodated in any pair of sockets as may be found desirable. Further according to the present invention there is provided a plug and socket connector incorporating a base which is characterised
 50 by an earthing socket contact and at least two pairs of associated socket contacts, one or more of the socket contact or plug receiving apertures adapted to receive the plug pins of lesser amperage
 55 being characterised by a certain reduction in that it or they will refuse one or more of the standard pins for the lower amperage, but will receive a plug at least one of the pins of which is correspondingly reduced, this said plug however being capable of engagement with
 60 the standard lower amperage sockets. In

this specification the use of the word "standard" implies that the article concerned is made to British Standard
 65 Specification as issued by the British Standards Institution.

In order that this invention may be clearly understood and readily carried
 70 into practice, reference may be had to the appended drawing, upon which:—

Figure 1 illustrates in perspective a socketed base constructed in accordance with the present invention.

Figures 2 and 3 illustrate in plan view
 75 the earthing pin socket without and with plug pin inserted respectively.

Figure 4 illustrates in perspective the cover constructed in accordance with the
 80 present invention.

Figures 5 and 6 illustrate respectively the larger and smaller amperage plugs for use with the present socketed base.

Figures 7 and 8 illustrate in elevation
 85 and plan respectively a modified earthing socket in accordance with the present invention.

In a convenient embodiment of the present invention the isolated socket in the base is adapted to accommodate the
 90 earthing pin. This isolated socket may comprise two or more spring jaws *a* which are so mounted upon obliquely disposed slidable and spring controlled pins *a'* that the earthing pin *b*, *b'*
 95 (Figures 5 and 6) is effectively accommodated and clinched irrespective as to whether it is designed for five (Figure 6) or fifteen (Figure 5) amperage service. The remaining sockets are
 100 arranged in pairs *c* and *d*, that is to say, each pair comprises a small socket *c* and a larger socket *d* each pair of sockets being connected as for instance at their lower parts by a plate or connector *e*
 105 associated with a terminal *e'*. *e''* are U-shaped spring clips which hold the halves of the sockets *c* and *d* in resilient receptive relationship. Separate apertures may be provided in the cover (see
 110 Figure 4) for the base *f* whereon the sockets *a*, *c*, *d* are accommodated and the holes *c'*, *d'* in the cover associated with the pairs of sockets *c* and *d* may unite with one another. *a'* is the hole for the
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earthing pin *b*. In such an arrangement it will be readily understood that a given socket structure (Figures 1 and 4) may alternatively accommodate two plugs (Figures 5 and 6), as for instance for a five amp plug (Figure 6) the earthing pin *b*¹ is clinched by the earthing socket *a* and the current carrying pins *b*² may engage the inner or smaller sockets *c* by way of *c*¹ whereas when a fifteen amp. plug (Figure 5) is substituted the same earthing socket *a* accommodates the larger diameter earthing pin *b* and the larger or outer sockets *d* accommodate the larger current carrying pins *b*² by way of *d*¹.

Figures 7 and 8 illustrate a modified earthing socket. In this construction there is provided a tube *g* adapted to receive an earthing pin such as *b*, or a smaller earthing pin such as *b*¹. The larger pin *b* fits comfortably in the tube *g*, but the smaller pin *b*¹ is accommodated by means of an arcuate liner *g*¹ supported by spring arms *g*². This liner holds the smaller pin *b*¹ between itself and the opposite wall of the tube *g* so that the pins *b*² (Figure 6) may be accurately located in the apertures *c*¹ (Figure 4).

It is undesirable to utilise a 5 amp. plug without a fuse on a 15 amp. socket, and in the present invention means are provided whereby the ordinary standard 5 amp. plug shall not be used with the present mechanism. Accordingly one of the plug pins see *b*² (Figure 6) of a 5 amp plug is provided with a flat face *b*⁴ constituting a reduction in the dimension of the pin and the insulating cover (Figure 4) for the base is so constructed that one of its apertures *c*¹ associated with the 5 amp sockets presents a flat face *c*² which while permitting of the insertion of a 5 amp plug with the flat face *b*⁴ will refuse an ordinary standard 5 amp plug with round pins.

It is to be appreciated that the manufacturer constructing his special plug with the flat face will ensure that these plugs incorporate 5 amp fuses, and it is further to be appreciated that such specially constructed plugs with flat faces and fuses are suitable for use in standard 5 amp sockets seeing that one of the pins has merely been reduced along its face. Again the ordinary unmodified 5 amp plug with round pins with or without a fuse cannot be accommodated in the present device.

Although flat faces have been referred to upon the pin and socket aperture of the 5 amp plug, it will be appreciated that any form of reduction of the pin and its corresponding aperture in the

base cover or socket itself will suffice, the desideratum being that although this plug pin will enter its particular socket, the said socket will refuse an ordinary completely circular plug pin, the adapted plug pin being however capable of entering a standard socket.

In a modification of the present invention instead of utilising one isolated socket and two pairs of associated sockets a single isolated socket may be utilised a hereinbefore for the earthing pin and three or more pairs of associated sockets may be employed whereby the socket is capable of accepting three or more different sizes of plugs for example those of two amp, five amp and fifteen amp.

I am aware that a plug and socket connector has been proposed comprising a socket member having a pair of socket elements each comprising two sockets of different size which merge into one another and the adaptation of such a device for a third plug pin was proposed. In the present invention the associated sockets are disposed in side by side relationship and do not merge into one another.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A plug and socket connector incorporating a base which is characterised by one isolated socket and at least two pairs of associated but not merging sockets, the isolated socket being of a two dimensional or variable expansive character so that some part or the whole of its inner contact surface superficially engages either or any of two or more selected plug pins of differing amperage rating, the remaining two pins of any given plug being selectively accommodated in any pair of sockets as may be found desirable.

2. A plug and socket connector as claimed in claim 1 incorporating a base which is characterised by an earthing socket contact and at least two pairs of associated socket contacts, one or more of the socket contact or plug receiving apertures adapted to receive the plug pins of lesser amperage being characterised by a certain reduction in that it or they will refuse one or more of the standard pins for the said lower amperage, but will receive a plug at least one of the pins of which is correspondingly reduced, this said plug however being capable of engagement with the standard lower amperage sockets.

3. A plug and socket connector as claimed in either of the foregoing claims incorporating an isolated earthing socket

comprising two sliding spring-controlled jaws, and two or more pairs of electrically live sockets, the sockets of each pair being connected by common terminals.

5 4. A plug and socket connector as claimed in claims 1, 2 or 3, wherein a flat or equivalent formation is provided upon one of the live plug pins adapted to co-
10 operate with the flat or equivalent formation formed in the corresponding aperture in the cover for the purpose set forth.

5. A plug and socket connector as claimed in any of the foregoing claims,
15 incorporating an earthing pin socket substantially as described and illustrated

with reference to Figures 2 and 3 of the drawings.

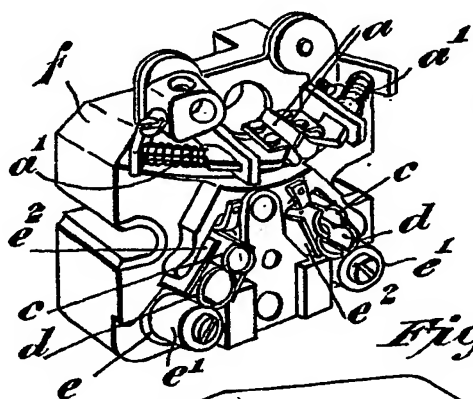
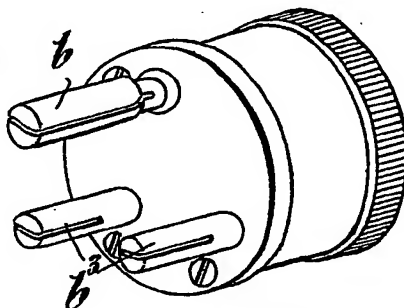
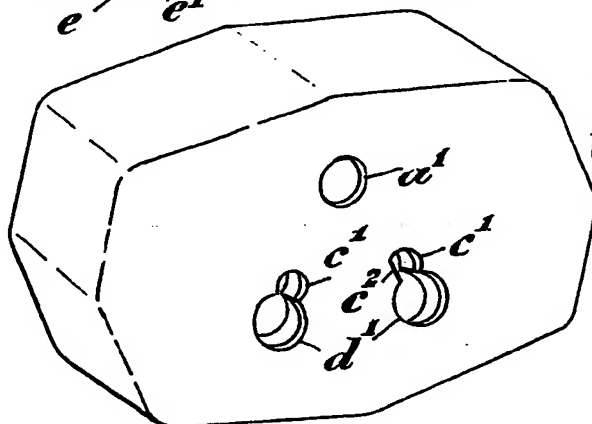
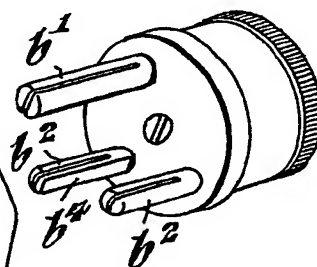
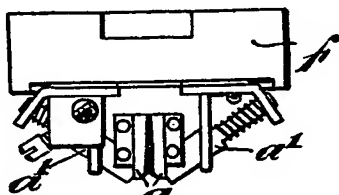
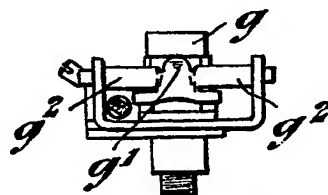
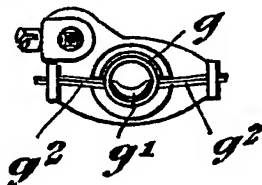
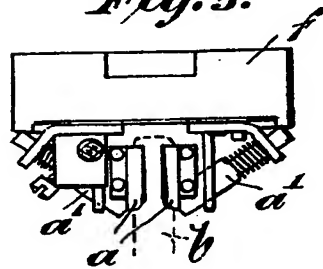
6. A plug and socket connector as claimed in any of the foregoing claims, 20 incorporating an earthing pin socket substantially as described and illustrated with reference to Figures 7 and 8 of the drawings.

7. A plug and socket connector as de- 25 scribed and shown.

Dated this 15th day of June, 1939.

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5, Corporation Street, Birmingham, 2,
Agents for Applicant.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1940.

Fig. 1.*Fig. 5.**Fig. 4.**Fig. 6.**Fig. 2.**Fig. 7.**Fig. 8.**Fig. 3.*

Malby & Sons, Photo-Lith.

[This Drawing is a reproduction of the Original on a reduced scale.]